

# 糧食蛻變

以消費者力量創建公平的糧食未來



**GROW**  
FOOD. LIFE. PLANET.

  
**OXFAM**

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# 引言

## THE FOOD TRANSFORMATION

### HARNESSING CONSUMER POWER TO CREATE A FAIR FOOD FUTURE

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每當打開雪櫃或食物櫃，你便走進全球的糧食系統。雖然聽起來有點奇怪，但這卻是我們現實的世界。這個系統錯綜複雜，牽涉所有生產、分配、銷售和消耗糧食的個人、企業、組織和政府。不論我們是誰或身在何方，我們所吃的食物都來自這個全球糧食系統。

在21世紀伊始的此刻，全球糧食系統並沒有正常運作，導致每日有近10億人挨餓。但另一邊廂超過半數的工業化國家，有50%以上的人口超重。這個系統價格波動，令小型生產商以至消費者吃盡苦頭，而且越來越被少數影響力巨大的企業壟斷；這個系統的運作一方面加劇氣候變化，另一方面又極易受氣候變化影響。這是一個既不公平，亦不能持續的系統。

糧食系統顯然需要整頓，但很多人卻茫無頭緒。因為它非常龐大和複雜，而且部分企業和政府在其中有著驚人的影響力。這些企業和政府有能力且必須盡快採取行動，在影響糧食系統深遠的政策和做法上，作出改變。

不過，在這系統中，企業和政府並非唯一力量。作為購買、烹調和享用糧食的消費者，我們可發揮的影響力，其實比想像中大得多。如果我們能夠團結一致地表示，我們希望要這而不是那，就可成為一股足以影響糧食系統的力量。如果我們有足夠的人站起來，表達我們的訴求，那麼現存的勢力便不能忽視我們：他們只能順應我們的要求，否則便會被淘汰。

在大部分時間，我們都不易察覺自己擁有的力量。每日，我們都要處理家庭開支、照顧家人健康，還有處理大小事務，實在難以分身去考慮世界大局，也難以顧及全球數以百萬計、與我們一樣要面對生活挑戰而掙扎的人。



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在這份報告，我們會以深入淺出的方式與你探討世界糧食局勢，為你呈現全球糧食系統與我們日常生活的關係，並且展示家庭之間可以如何攜手合力，帶來改變。

為達到此目標，我們將在這報告內探討一系列「如果.....，那麼.....」的問題。我們希望了解「如果」各家庭在購物、烹調和進食時都能邁出一小步，作出改

變，「那麼」世界會變成怎樣？根據廣泛的數據，我們推計出各種日常習慣改變可帶來的影響，以及對全球糧食系統的意義。我們希望藉此展示如果人們攜手合力，能夠如何改變糧食系統。這份報告將集中介紹、解釋及闡述這些「如果」，展示小行動能如何帶動未來的大改變。

為了易於掌握和了解整體現實情況，我們聚焦在三個已發展國家和三個發展中國家的家庭，這六個國家包括巴西、印度、菲律賓、西班牙、英國和美國。雖然它們不能代表全世界，但亦有助說明幾個重要趨勢。

我們特別研究城市和大型城鎮的家庭。某些全球糧食不公義的現象，在世界各地的城市最為明顯。在發展中國家的城市裡，很多人都為獲取足夠食物餬口而掙扎求生；而全球各地的城市和城鎮，則往往是消費力最高的地區。在這些地區，富裕家庭的生活選擇，對糧食系統足影響重大，但是這些富裕的城市家庭與糧食生產者之間的聯繫，卻最為疏離。這種疏離可能正是糧食系統未能正常運作的主要原因之一。縱使人們想知道所吃的食物是如何或在哪裡生產，卻難以找到答案。

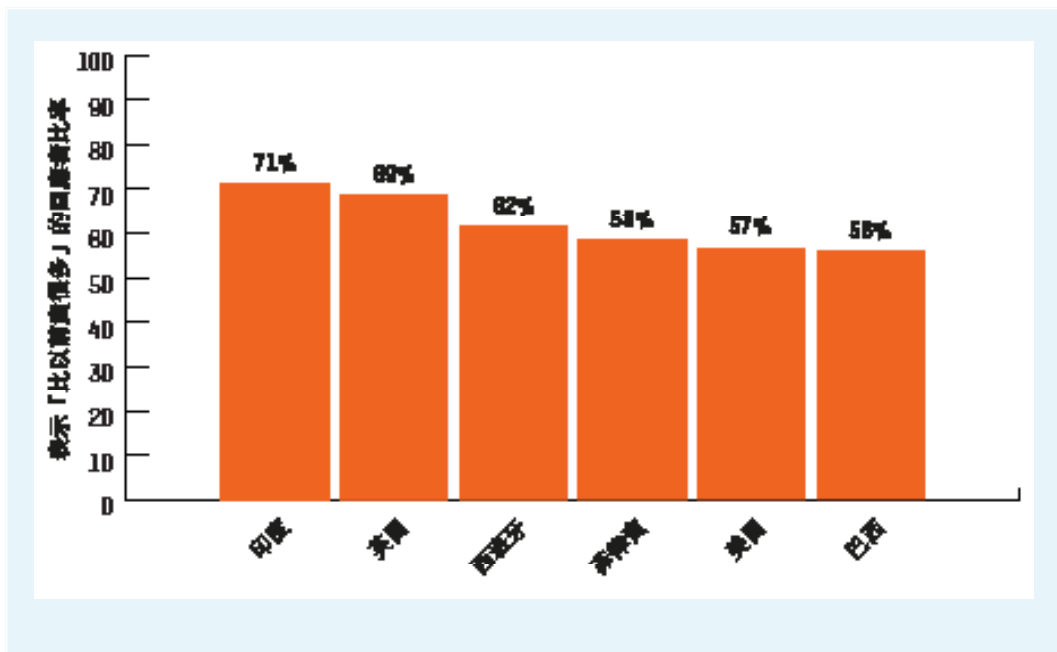
我們希望知道，這六個國家的人民對糧食問題的看法。在世界各地（包括六個所挑選的國家），從購買食物，到烹調過程中的每個選擇，大部分都由婦女決定。負責煮食的婦女，人數幾近男性的兩倍，而婦女花在準備、烹調和膳後清潔的時間，更差不多是男性的四倍。這種家庭責任分配不平等的情況，當然有問題，需要糾正。但這亦反映在目前為止，大部分有關家事的決定，都是由婦女主導。因此我們相信，她們婦女們擁有改變全球糧食系統的驚人力量。因此，我們訪查這些主要決策者——居住在這六個國家的城鎮和城市的已婚婦女，並向她們提問幾條關於食物的問題。



西東帝汶的母親與孩子  
© Tom Greenwood / Oxfam

我們收集逾5,000名婦女的回應，以下是她們的部分見：

圖1：食物價格上升



問：「與兩、三年前比較，你認為食物...」

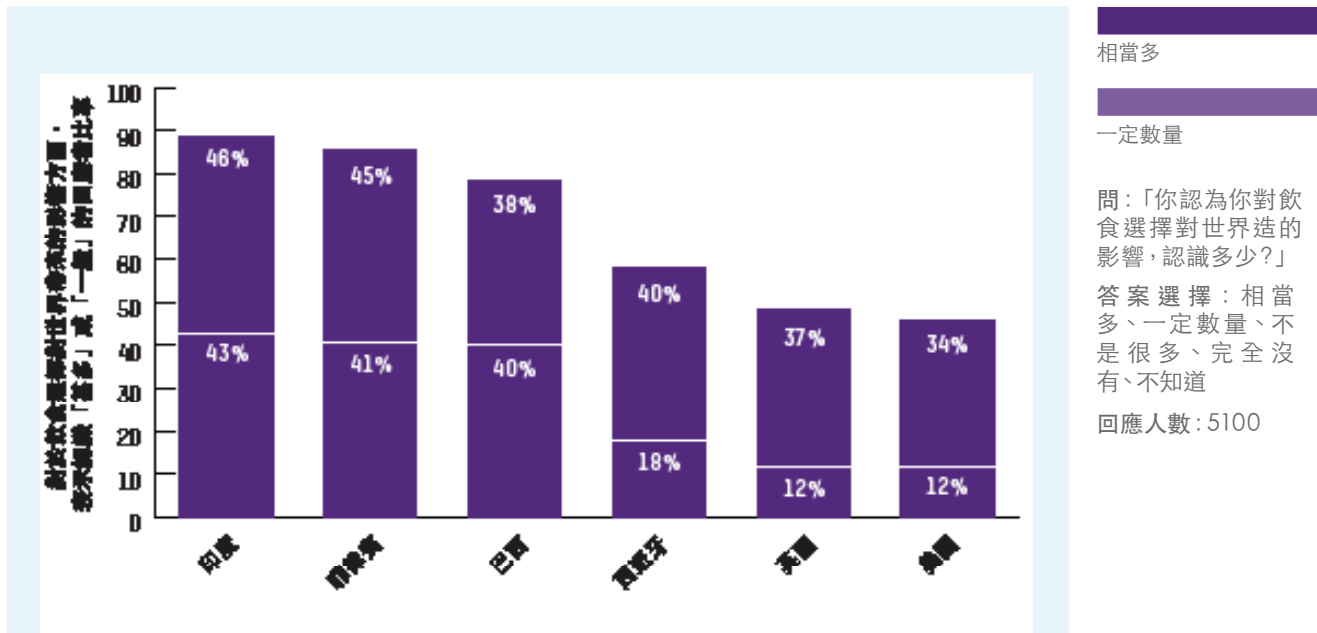
答案選擇：貴很多、貴一點、價格相若、便宜一點、便宜很多、不知道

回應人數：5100

結果清楚顯示六個國家的城市或城鎮家庭，近年都經歷了糧食價格上漲。



圖2：對飲食選擇帶來的影響的認識



結果清楚反映，相比已發展國家，發展中國家的回應者，對於飲食選擇對世界帶來的影響，以及與食物生產者，都有更深的理解和聯繫感。

圖3：與糧食生產者的聯繫

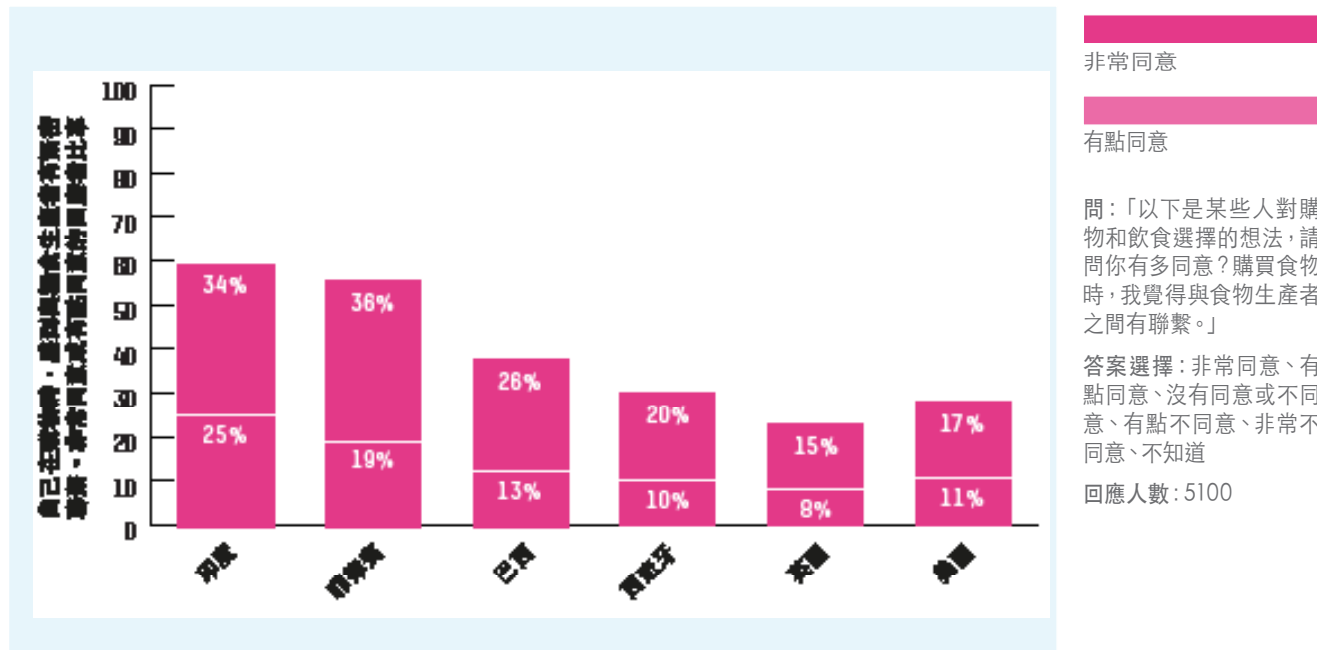
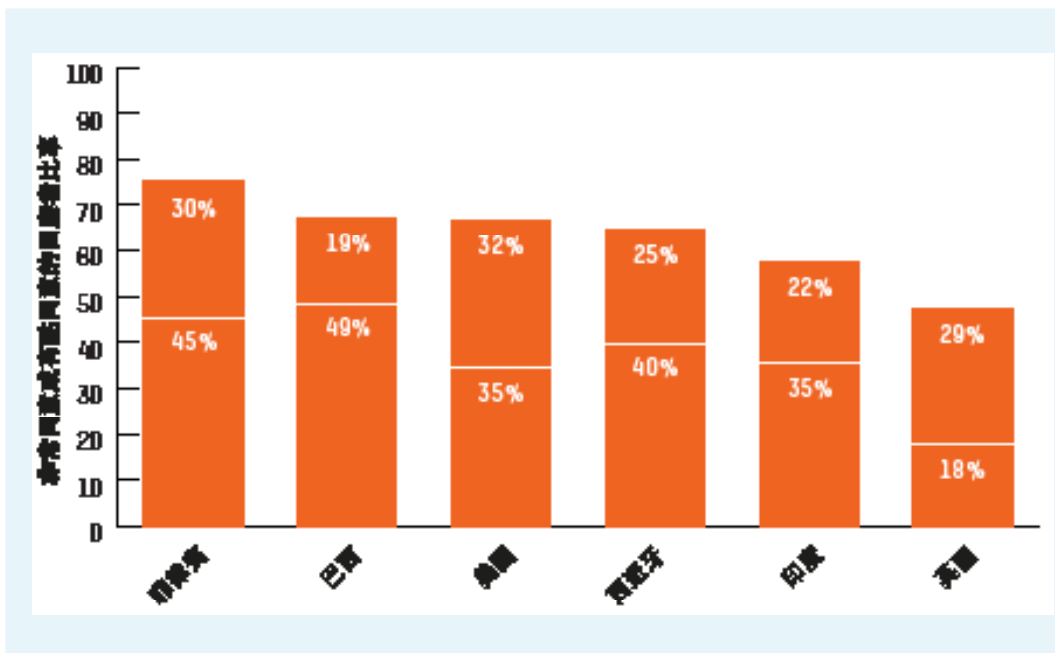


圖4：關注食物如何生產



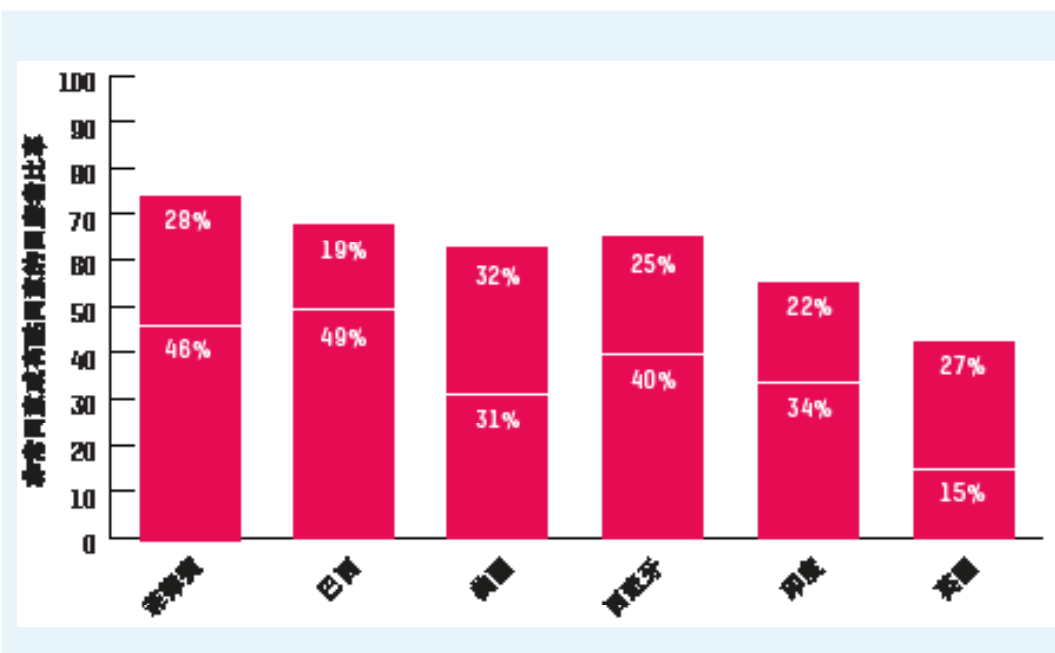
非常同意  
 有點同意

問：「以下是某些人對購物和飲食選擇的想法，請問你有多同意？我不關心我的食物的生產方式。」

答案選擇：非常同意、有點同意、沒有同意或不同意、有點不同意、非常不同意、不知道

回應人數：5100

圖5：關注食物在哪裡生產



非常同意  
 有點同意

問：「以下是某些人對購物和飲食選擇的想法，請問你有多同意？我並不關心我的食物在哪裡生產。」

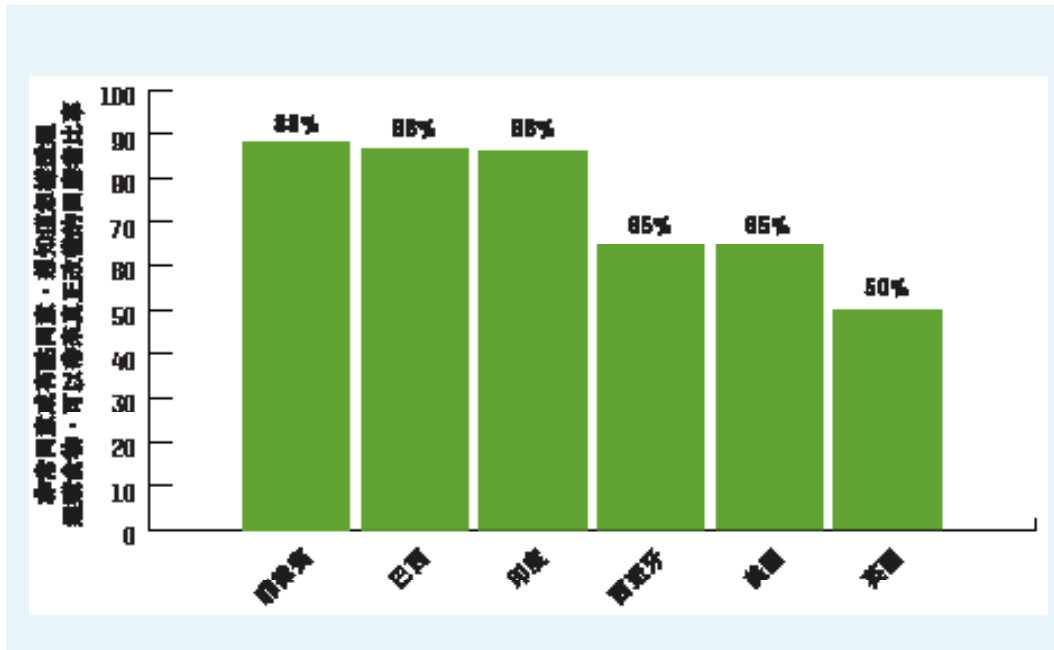
答案選擇：非常同意、有點同意、沒有同意或不同意、有點不同意、非常不同意、不知道

回應人數：5100

圖4和圖5顯示了受訪者對食物生產方式和產地的想法。雖然想法各異，但除了英國以外，全部國家的受訪者均對食物生產方式和產地表示關注。



圖6：想知道怎樣才能帶來改變



問：「以下是某些人對購物和飲食選擇的想法，請問你有多同意？我想知道如何透過選購食物，帶來真正改變。」

選擇答案：非常同意、有點同意、沒有同意或不同意、有點不同意、非常不同意、不知道

回應人數：5100

綜合各項調查結果，呈現出的重要契機：全球城鎮和城市的主要決定者，都希望有更佳的糧食系統。這分報告的其餘部分，將探討她們可以如何齊心合力，達成願望。

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如果失衡，就把它修正

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這份報告有關我們可以採取甚麼行動，糾正失衡的糧食系統；有關我們如何把在飯桌上，與家人及朋友分享的食物，作為起點，為未來建立更美好的世界；有關我們能夠如何逐步，向更公平、更具可持續性的世界——人人都能溫飽的世界邁進。

我們都希望自己和家人能獲得健康有益的食物，而我們大部分都是在有限金錢下，實現這個目標。與此同時，我們也希望現在所作的決定，不會以我們子女日後身處的世界作為代價。我們希望家人和世界其他人都能得到最好的東西，但是卻茫無頭緒。試想想，其實只需一點助力，我們便能攜手締造轉變。

樂施會現正透過GROW糧食公義運動，幫助修正失衡的糧食系統。這個任務需要每個人——從生產和銷售食物的人，到購買和烹調食物的我們，以至政府和大型飲食公司的參與。成為這個運動的一分子，你便會知道我們可以合力做甚麼，令糧食變得更公平和更具可持續性。

## 失衡的糧食系統

這個故事從地球、從努力耕耘的農民開始。它帶領我們從本地市場，穿越超級市場和世界市場，透過雪櫃和煮食爐，越過餐桌，進入垃圾桶、再到達世界各地的堆填區。

### 糧食生產

全球食物生產者正面臨重大的挑戰。隨着人口增長和經濟發展，2050年全球食物需求將增加70%。

在許多發展中國家，小農要生產大量的糧食。還有，全球四分之三的貧窮人口，都住在農村，當中大部份人都以務農為生。

小規模糧食生產者因缺乏支援和基礎建設而艱苦求存，同時亦要面對極端天氣和氣候變化所帶來的多重風險。縱使最後能夠產出糧食，但是在收割、運輸和貯藏的過程中，約三分之一會被損耗，無法被人享用。更糟的是，小規模糧食生產者在進入市場、銷售農產品時，要面對重重障礙；即使最後能成功進入買賣市場，亦有可能被剝削。



正在收成咖啡豆的肯尼亞農民 © Ami Vitaki

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發展中國家的小規模糧食生產者需要幫助，以克服種種挑戰；確保他們獲得援助，非常重要。按理他們並非處於糧食系統的邊緣，相反，他們是糧食系統的骨幹，處於最佳位置去為飢餓的人供應食物。

婦女處於特別不利的位置。在全球農業的總勞動人口中，婦女佔43%。但是全球土地擁有人中，只有10-20%是婦女。在某些國家，婦女只能獲得極少部分為小農而設的培訓和支援。假如婦女能夠得到與男性一樣的資源，她們就可以提升約四分之一糧量，可以為全球減少多達1.5億的飢餓人口。

## 食物分配

我們所有人所需的食物份量都差不多，同時也需要合適的營養。不過，食物——不論是卡路里還是營養——卻沒有在世界各地平均分配。這種不公義，對於我們的健康、環境，以至我們未來養活全球人口的能力，都有深遠影響；這種不公義，亟需政府與食品企業，盡快共同回應。

全球許多食物都集中在地球的北部和西部，其他地區則沒有足夠的食物。在歐洲，商舖和食店裡的食物，足以令當地每人每日攝取超過3,000卡路里；在美國，更約達3,600卡路里。其實，我們並不需要這麼多，平均每人每天只需攝取約2,000 卡路里便足夠。

這些額外的卡路里跑到了哪裡？當中部分被我們吃進肚裡——想想那些充滿「無營養卡路里」的零食。它們使越來越多人超重，使肥胖症肆虐全球。至於沒有被吃掉的卡路里，就被丟進我們的垃圾桶裡，通常會被運到堆填區，而腐化後還產生導致氣候變化的溫室氣體。

世界其他地方，每人每日只能攝取到僅1,500卡路里。同樣地，婦女是最受食物分配不均影響的人。營養不良的婦女人數是男性的兩倍，女童因營養不良而死亡的機會，亦為男童的兩倍。其實，我們只需目前3%的全球糧食供應量，便能為全球13%的飢餓人口補充所需的卡路里。

## 糧食消耗

食物不只關乎卡路里，也是享受的來源，是我們養活自己和其他人的途徑，也是家人和朋友之間的連繫。我們很多人都希望知道我們的食物來自哪裡，種植或生產食物的人又可以透過其努力獲得甚麼回報，但是要知道這些事情，並不容易。我們很多人早已失去與季節的聯繫，忘記了甚麼季節適合種植甚麼食物，因為超級市場似乎在任何時候，都可以提供每種食物。

這種疏離感讓我們不懂得珍惜食物。假如我們能想像人們在在種植和生產糧食期間所付出的辛勞和關顧，我們可能會更懂得珍惜食物。我們早已習慣全年都吃相同的食物，而不會問「現在有甚麼當造？」千篇一律的食物不但沉悶，還可能令我們變得不再享受食物，只會「為食而食」。



我們已習慣了在任何時節都食用同樣的食品 © YinYang / iStockPhoto



## 對未來糧食生產的意義

失衡的糧食系統——掙扎求存的生產者、不公平的分配與不滿意的消費者——製造出許多問題，影響我們的自然環境，令糧食生產者生活百上加斤。

全球近三分之一的溫室氣體排放量，來自農業，當中半數直接在生產食物時產生，另一半則因發展農業，砍伐森林，或土地退化所引致。運送食物同樣會對溫室氣體排放有所影響——雖然當中各有正、反複雜因素，令我們難以輕易判斷應該在本地種植我們需要的食物，或要輸入的其他地區的當造食品。當被損耗或浪費的食物被運送到堆填區時，會再產生溫室氣體，而更糟糕的是，在處理這些被浪費的食物的過程中，亦會不必要地產生溫室氣體。以上種種所排放的溫室氣體累積起來，引致氣候變化。

現代密集式的耕種方法，採用如氮肥等化學物質，進一步傷害我們的環境。這些原本用於改善農作物的化學品，大部份在過程中流失，到處帶來破壞。部分被沖到河流的化肥，「滋養」海藻，使海藻大量生長，耗盡水裡的氧份，令魚類和水中的野生生物窒息致死。此外，部分釋出毒素的藻類，更會對野生動物和人類構成危險。

凡此種種——變化的氣候和受破壞的環境——都會影響耕地的質素和產量、季節性的水源供應和種植季節。這些轉變正削弱全球最貧困人口為其家人和社區生產糧食的能力。

## 我們可以做甚麼

樂施會以「GROW良食良方」法作為開端，讓大家開始討論日常生活可以做甚麼，以及如何透過與食物的互動，協助重新調整糧食系統，建立讓世代代都能得到溫飽的未來。

從購買食物，到在廚房烹調，由早餐、午餐到晚餐之後，「GROW良食良方」都會一一涵蓋。這條邁向可持續糧食未來之路，從五個簡單的原則開始，部分我們早已付諸實行：

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#### 惜每餐



為滿足我們每日三餐所需，在全球糧食從農場到餐桌的生產過程中，近三分之一被損耗或浪費掉。其實，只要仔細計劃你的三餐，並盡量善用剩食和廚餘，我們便能減少浪費，並有助減少堆填區的溫室氣體排放，有利可持續發展。

#### 挺小農



透過支持小規模糧食生產者，我們就能幫助全球15億依賴小規模農場維生的人，同時又可間接推動可持續的耕作方式，保障未來的糧食生產。選購公平貿易產品和品牌，便是一個挺小農的好例子。

#### 嚐四季



不依循天時地利種植農作物會浪費大量能源。其實，四季不只用來賞，還應以味覺品嚐。多發掘我們身邊的當造食物，定會發現可口的水果和蔬菜，並有助減少食物運輸所產生的溫室氣體。

#### 巧煮意



每天使用珍貴的化石燃料煮食，不但令地球累積更多溫室氣體，昂貴的能源費亦有損荷包。煮食時發揮巧思，例如煮食時蓋上鍋蓋、水滾後立即減低火力等，能同時節省能源、食水和金錢。

#### 啖素綠



與種植農作物相比，飼養動物作為糧食會製造更多溫室氣體，也會耗用更多食水和土地資源。多吃素、常吃綠，減少食用肉類和蛋奶類食品，便能大大減少我們飲食習慣對地球的負面影響。

我們會在往後數頁，探討這些正面行動能夠發揮甚麼效果。當中會利用一些簡單的例子，並且會問「如果」我們做出幾個小小的轉變，會對我們的糧食系統和宏觀世界，有甚麼影響？雖然這裡探討的行動並非完整的解決方法，但卻可作為起步點，同時顯示我們同心合力所能達到的成果。

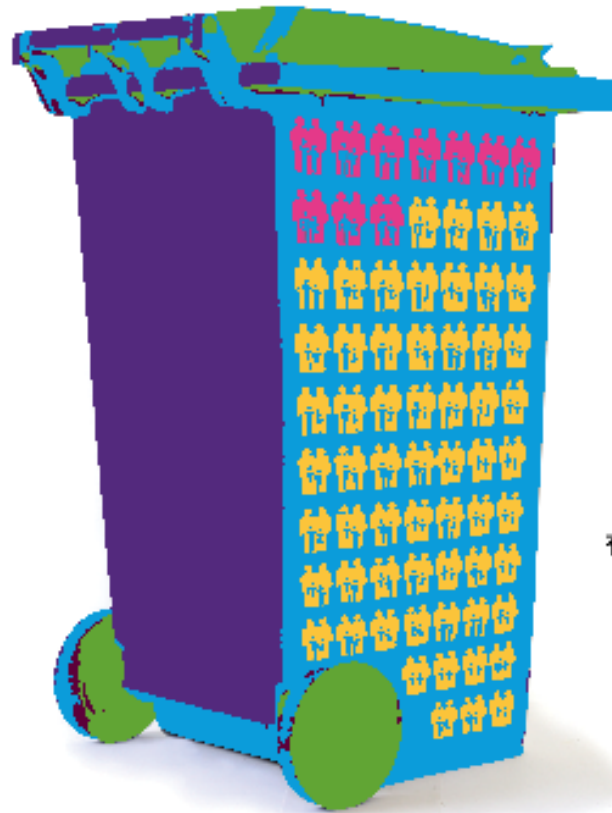
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**THE FOOD TRANSFORMATION**

HARNESSING CONSUMER POWER TO CREATE A FAIR FOOD FUTURE

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如果.....，那麼.....



全球每七人中  
有一人捱餓。

供給人類的糧食中，  
有三分之一被浪費。

## 食物浪費

世界存在食物浪費的問題。供應人類的糧食中，從農場到餐桌的生產過程中，有三分之被耗損或浪費。富裕國家每年丟棄的食物總量，差不多等於非洲撒哈拉以南地區的糧食生產量。當前全球有近10億人口捱餓，對食物的需求與日俱增，我們大家都需要出一分力，確保有需要的人都能獲得糧食，而非任由它在堆填區內腐爛。

浪費食物並非單一問題，而是在各個面向都會帶來影響。生產食物、把食物運到堆填區，都會導致溫室氣體排放，繼而影響氣候變化，令農民更難為全球供應糧食。氣候變化引發種種問題，使我們未來可能要捱餓。

# 如果我們永遠不讓蘋果放到腐爛， 那麼.....



## THE FOOD TRANSFORMATION

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沒有人會喜歡丟棄食物，但我們的生活極度繁忙，加上有時難以討好要求多多的家人，所以我們都難免會丟棄食物。雖然動機良好，但是我們購買的食物，最終都沒有完全被吃掉。舉例來說，在巴西、印度、西班牙、菲律賓、英國及美國，每六個售出的新鮮蘋果中，就有一個被丟到垃圾桶。

### 53億個蘋果

假如我們由蘋果開始，踏出一步，確保我們所買的食物都被吃掉，那又會怎樣？要這樣做，我們可以先確保用最適合和可行的方法儲存蘋果，在購買前先弄清楚家裡有多少個蘋果，並且按購買次序來吃。若能如此，這六個國家的城市家庭每年便可以省回53億個蘋果。這些蘋果排起來的話，足足可以環繞地球九次。

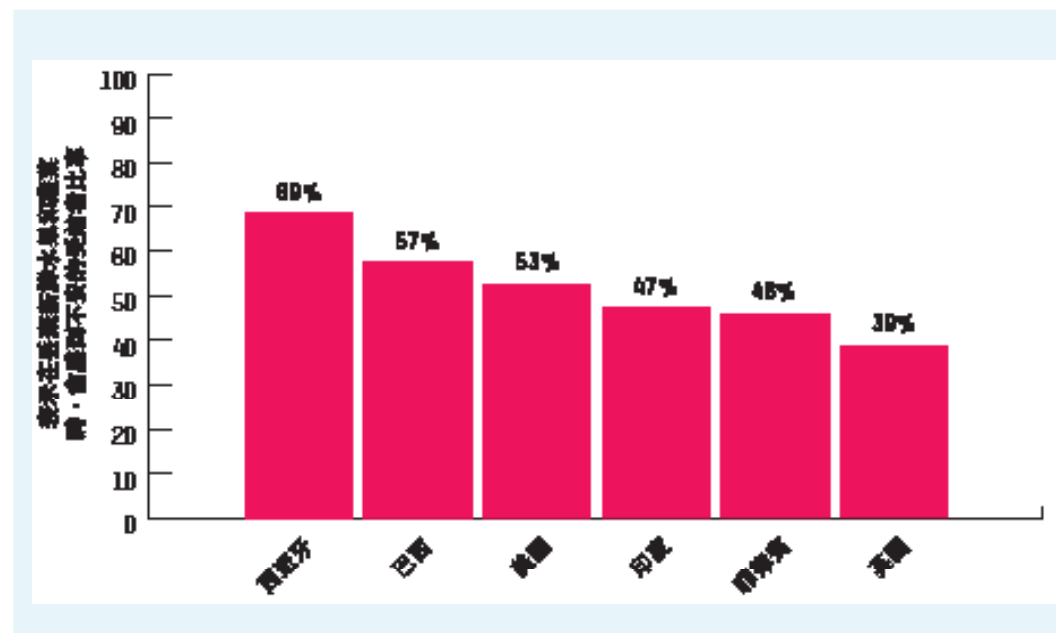
### 防止食物變壞

丟棄食物的最常見原因，是我們還未來得及吃這些食物時，卻發現它已變壞。這雖然令人沮喪，但卻不要忘記，我們其實有方法預防食物變壞。以蘋果為例，很多人會喜歡把蘋果放在生果盤中，因為這樣似乎最方便家人食用。不過，其實把蘋果放進袋內，再放在雪櫃，其貯存時間會更長。這亦適用於大部份其他水果（除了香蕉和菠蘿）及許多蔬菜。

### 未來的糧食

這53億個被浪費掉的蘋果，會影響我們未來養活自己的能力。生產、收割、貯存、運輸和包裝這些蘋果所用的能源和肥料，全部都對大氣層和環境造成影響，為糧食系統增添不必要的負擔。當這些蘋果被送到堆填區後，還會製造出更多的溫室氣體，引致氣候變化。這些被浪費的蘋果所排放的溫室氣體量，相等於燃燒1,000萬桶石油。我們若只購買所需的蘋果，並且確保每個都被吃掉，便能保護農民目前和未來，為我們提供所需食物的能力。

圖 7：浪費食物會令我們有多不安？



問：若以1到5分來評分，5分為十分不安，1分為完全沒有不安。試想想，在丟棄新鮮水果和蔬菜時，你有多不安？

答案選擇：1（完全沒有不安）；2；3；4；5（十分不安）；從沒有丟掉食物；不知道

回應人數：5,097

## 糧價上升 小農噩耗

糧價上升時，你可能會想，對種植和生產食物的人來說，這是好消息，但事實卻非如此。發展中國家的小規模糧食生產者通常有超過一半的總收入用於購買糧食。很多家庭的糧食支出，比出售親手種植的農作物所得的收入還要多。

其中一個問題是，與我們在商店所付的價格相比，農民所得的金錢往往非常少。當價格上升，我們無法肯定我們支付的額外金錢可以到達農民手裡。這些錢可能落入零售商、生產商、貿易商和投機者等供應鏈上其他角色的口袋裡。小規模生產者因收入少，難以在農場投資，以回應農產品需求上的短期變化，以及支付越來越貴的所需物料和工具。此外，價格波動越見頻繁，亦令小型生產者更難計劃，未來應該種植甚麼和如何進行投資。



如果買給自己的巧克力，都是  
公平貿易巧克力，那麼.....

在購買巧克力給自己時，我們可以確保生產可可的小農獲得公平對待。假如我們所有人都能確定每月購買的兩排巧克力，都是公平貿易產品，單在巴西、西班牙、英國和美國的城市，每年就會售出超過125億排以公平貿易可可製成的巧克力。

### 更公平的交易

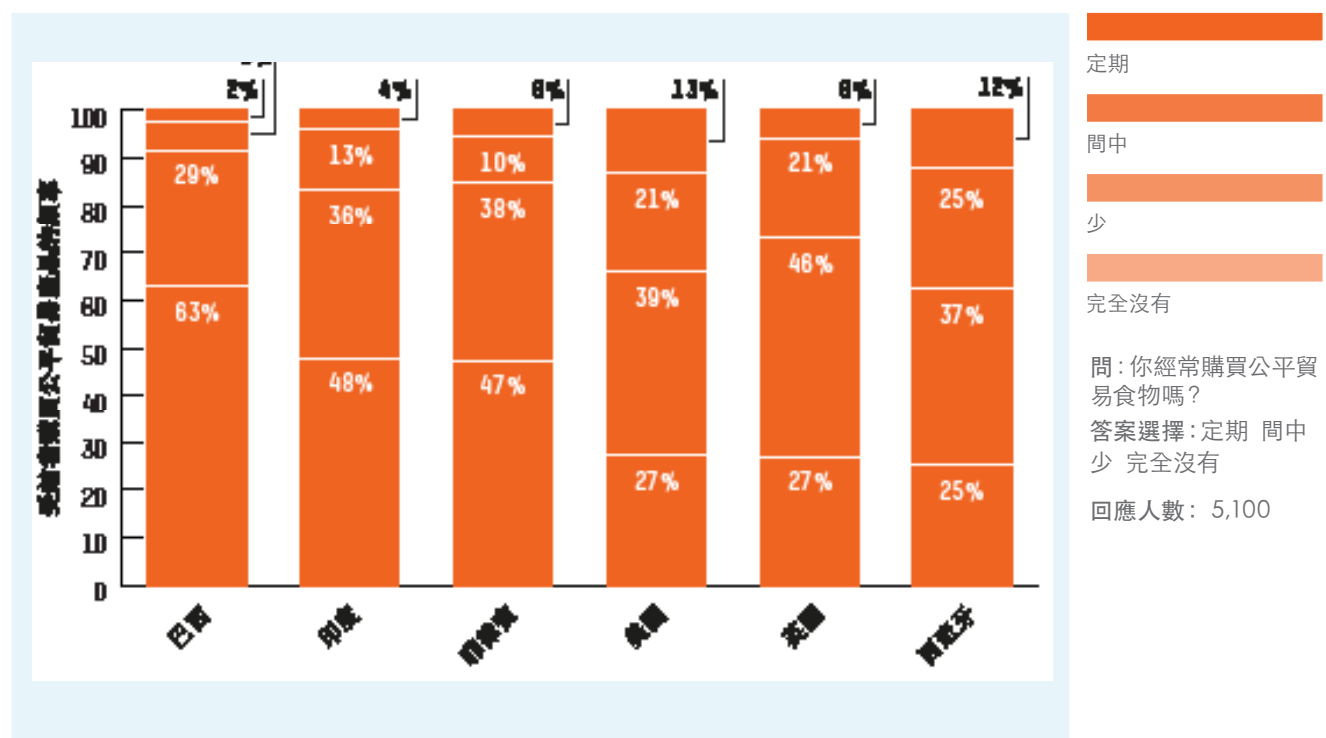
這125億排公平貿易巧克力，可以支持超過90,000個依賴小規模可可農場維生的人，整整一年的生活和工作。公平貿易產品能夠改變發展中國家人民的生活和生計，尤其是一眾公平貿易組織的出品，成效更大，因為其商業模式和價值營運，能為小規模生產者提供最大利益。公平貿易使家庭由貧困步向自給自足和經濟自主，使小規模生產商更容易進入市場，同時確保買家會關注他們的社會、經濟和環境各方面的福祉。

如果可可小農以公平價格出售其農產品，縱使全球糧食價格出現異動，也能確保他們有足夠的金錢為家人購買糧食。這對孕婦和幼童尤為重要，因為在懷孕期和幼兒期獲得所需的營養，對於健康成長和發展極為重要。營養會影響兒童在學校的表現——當然每位家長都希望子女能在校內有良好表現，以及他們長大後在工作的表現。

### 長遠利益

除了其他好處，公平貿易價格和公平貿易組織一年內提供穩定的價格與支援，都讓小型糧食生產者可以為他們的農場和家人作出長遠計劃，打破負債的循環。這樣不僅有助支持和維持農村經濟，而且能使農民和他們的子女在未來有更多選擇。這些選擇可以是教育和醫療項目，以至性別平等計劃和就業發展。

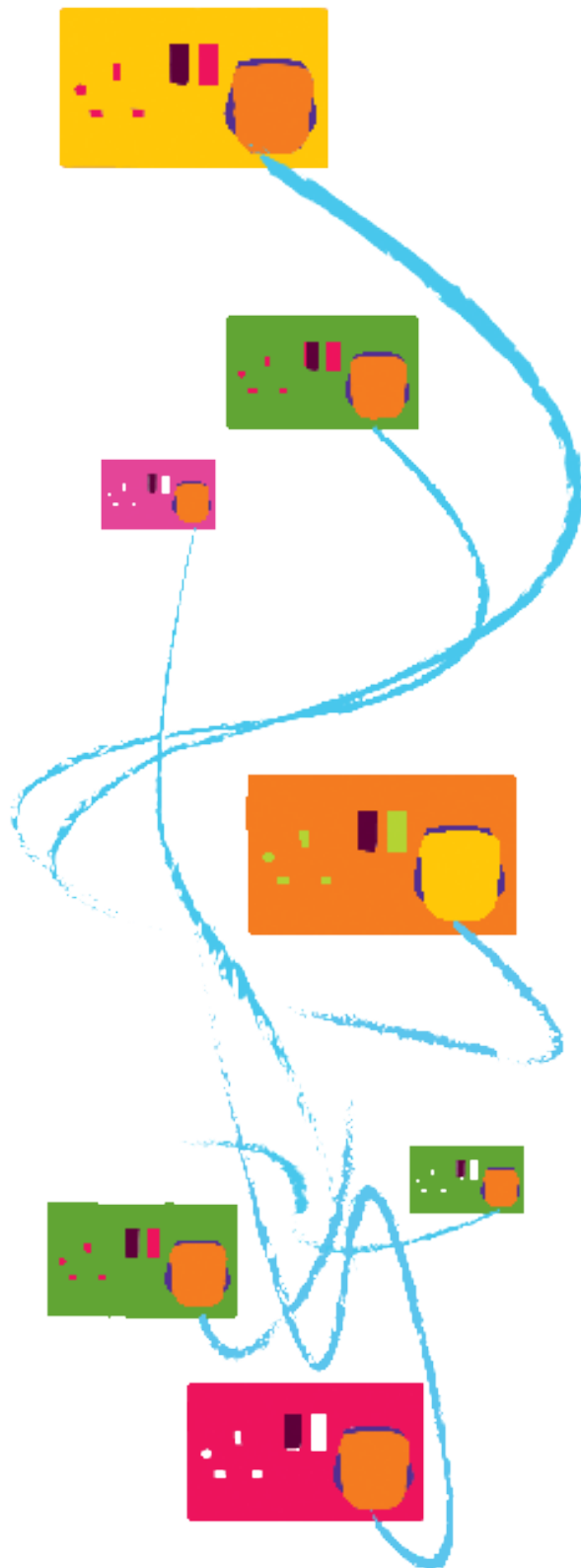
圖 8: 購買公平貿易產品



## 廚房裡平常的一天

雖然我們很多人都為家庭購買節能電器，但是我們卻比以前消耗更多、而不是更少能源。這與使用電器的方法息息相關。長期開着電器，使用備用模式，以及以低效方式使用電器——例如只需用少量水，卻把水煲和鍋子盛滿，凡此種種都會耗用更多能源。

如果我們能在煮食時節省能源，那麼.....



使用相同的用具、烹調相同的食物所需的能源，會因為我們如何煮食而大有不同。我們選擇的鍋子類型、煮食時有否使用鍋蓋，甚至是我們是否趕着煮食等等，都對此有影響。

### 高效煮食的三个簡單步驟

用煮食爐烹調蔬菜時，我們可按照下列的簡單步驟，節省最高達70%的能源耗用量：

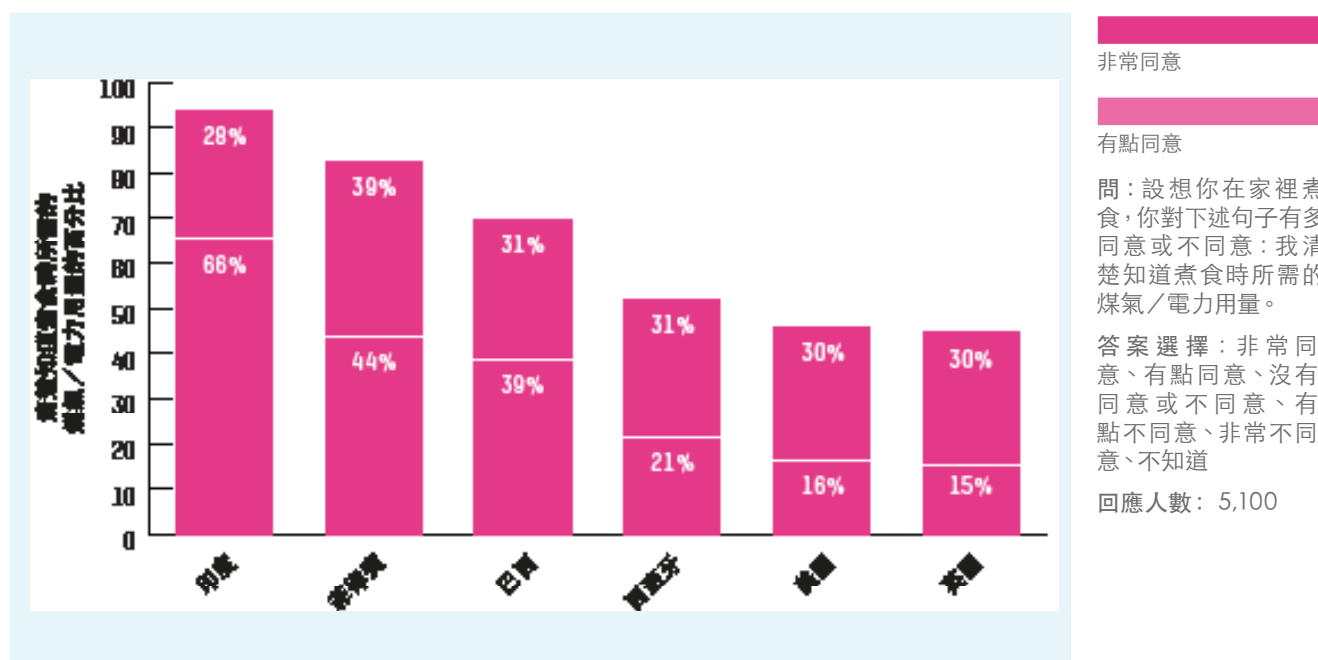
- 1.** 水只需蓋過蔬菜，無需注滿至鍋頂；
- 2.** 利用平底鍋，在煮食時蓋上鍋蓋；及
- 3.** 水沸騰後馬上減慢火力。

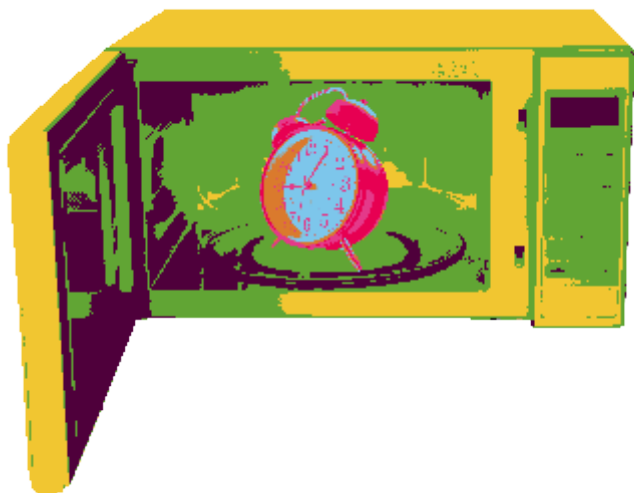
### 5.4億棵樹木

假如巴西、印度、菲律賓、西班牙、英國和美國所有城市的家庭，都採取這些簡單步驟，每年便可節省超過3,000萬兆瓦小時的能源。此舉對環境的好處，比這些家庭各播種並栽種一棵樹木十年還要大。



圖 9：能源的使用知識





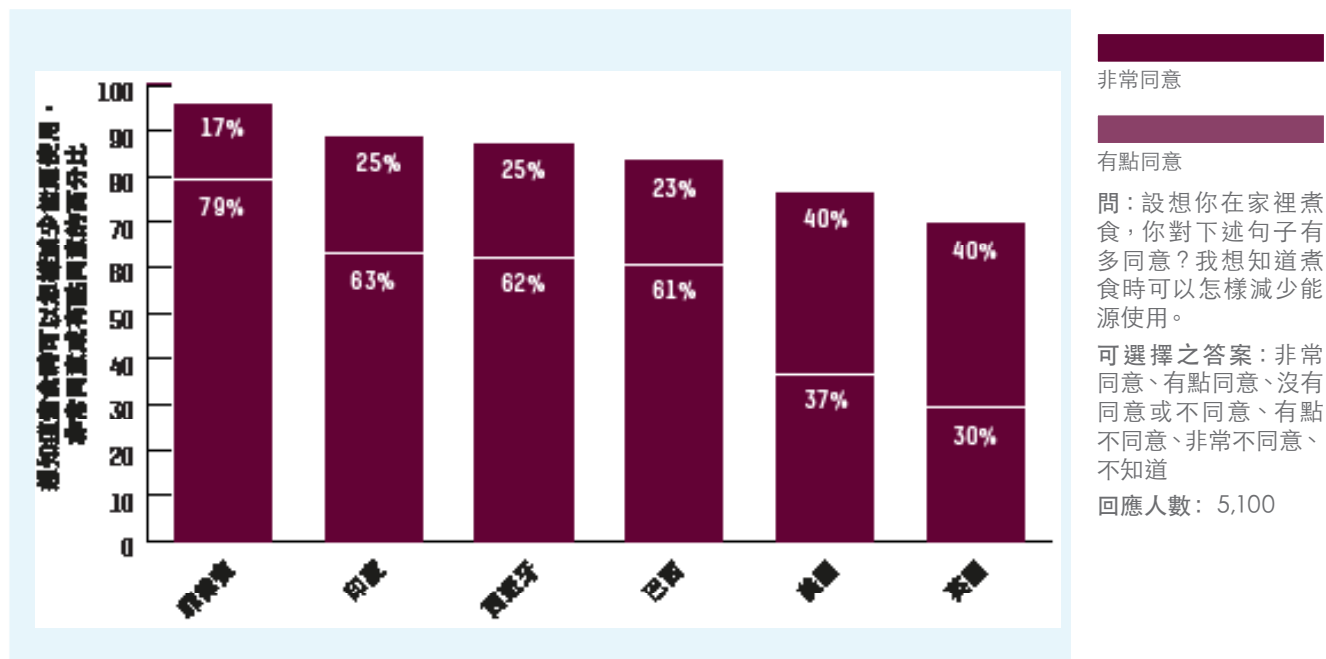
### 改變烹調技巧

使用煮食爐時，作出小改變，便可確保我們不會因加熱空氣和食水，而非食物，浪費時間、金錢和珍貴的化石能源。我們大部份人每日都利用煮食爐烹調食物，雖然每煮一餐用的能源很少，但是每餐累積起來的小改變，卻可帶來重大影響。

### 精明使用電器

在家裡，我們可以有很多節能方法——例如在不使用電器時，把它關掉或拔掉插頭-以微波爐為例，它近一半的用電量，都是耗用於那個電子時鐘而非加熱食物之上。我們更換廚房電器時，當然需要留意能源效益，但我們大多數人卻不會經常這樣做。改變我們使用電器的既有方式，是最快和最簡單的節能途徑。

圖 10：知道如何節省能源

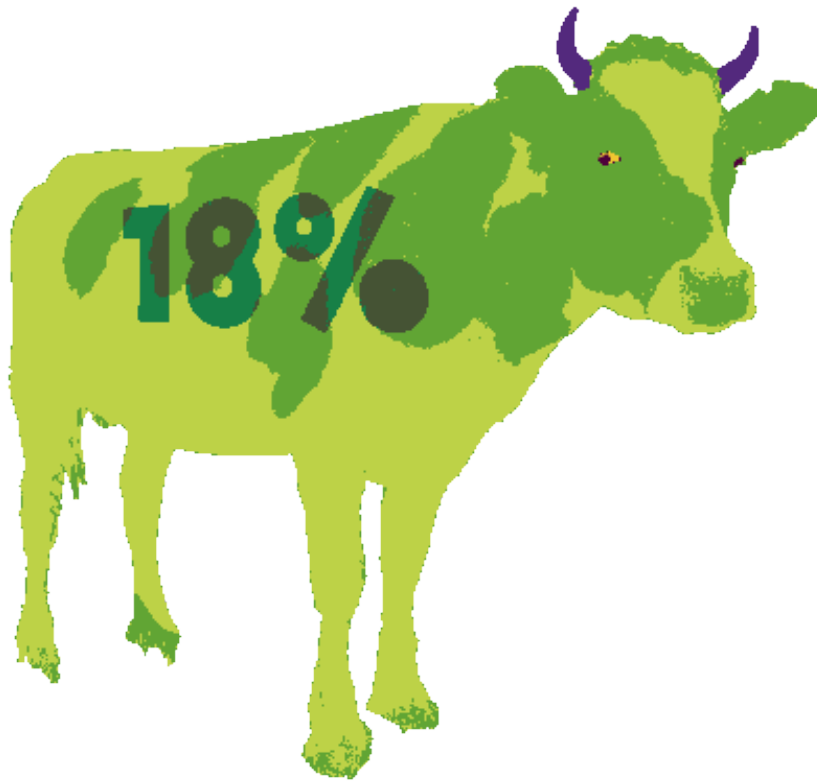


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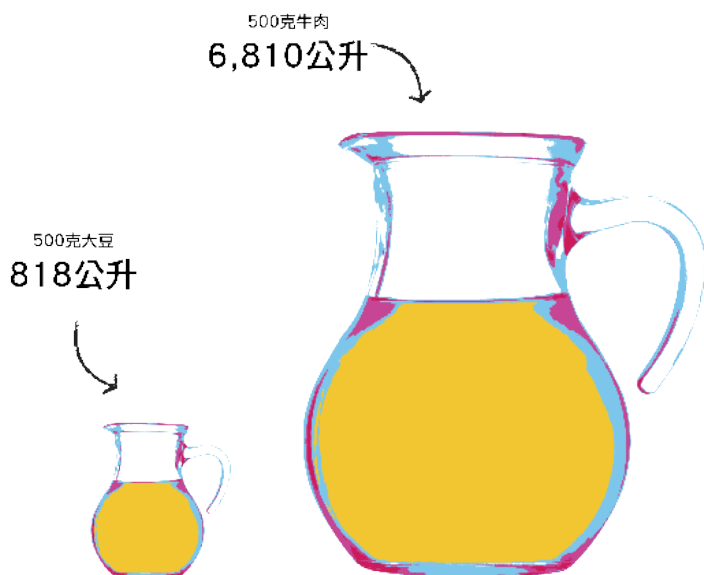


### 肉類影響 遠超所見

牲畜的消化系統(反芻動物如牛隻)和糞便，會製造出最危險的溫室氣體——甲烷和氧化氮。這兩種氣體比我們經常提及的二氧化碳的影響力更大。整體而言，牲畜所造成的溫室氣體排放量，佔全球溫室氣體排放量的18%。畜牧業同時使用大量食水——單是為牛隻種植食物，就已佔去全球人類用水量近8%。

每年，全球生產高達近人均42公斤的肉類；吃肉模式亦因地區和社會經濟地位而異。在富裕國家，部份人因食肉太多而健康出現問題；在發展中國家，很多人——特別是兒童——卻更加需要從其日常飲食中的肉類和奶類，吸收更多蛋白質和多種營養素。

如果城市家庭每周吃一餐「無肉餐」，  
那麼.....



假如我們可以把每周其中一餐的牛肉，換為蔬菜，就可以產生很大的效果。

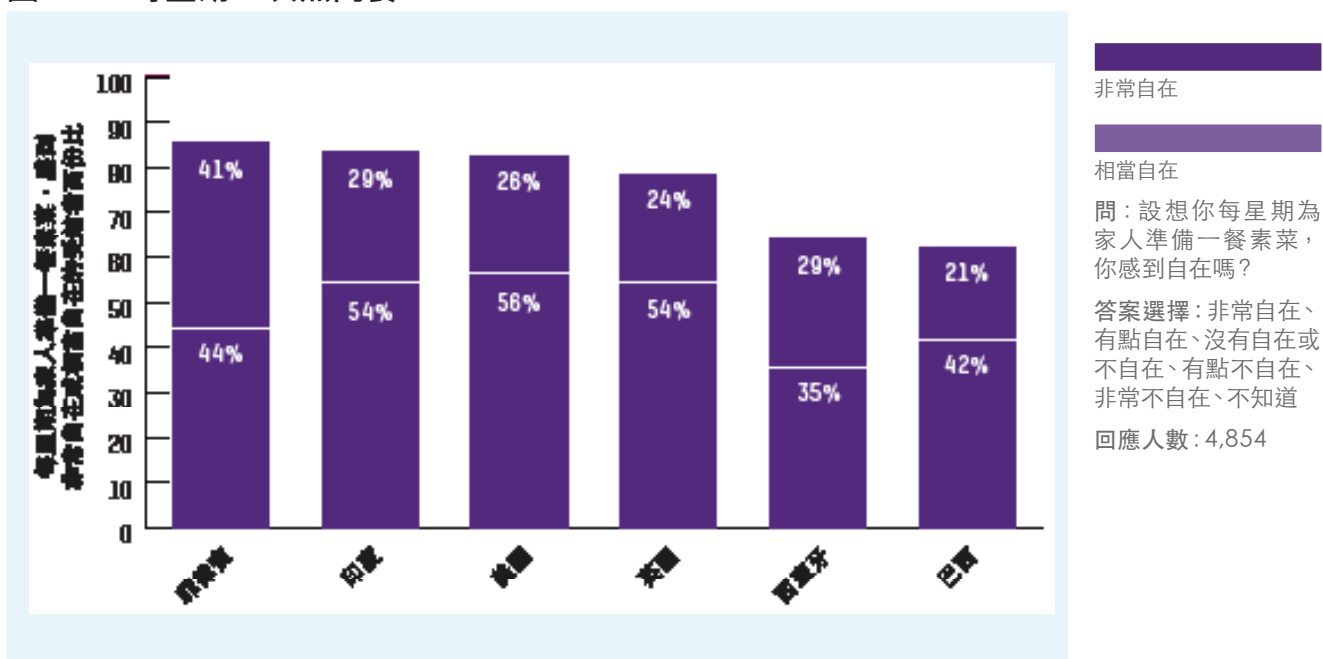
### 隱藏在食物的水

要生產500克牛肉(大約是煮一頓供4人食用的肉醬意粉所需的份量)，需要用6,810公升水。

這不是一個小數字。假如每個家庭 (兩個成人和兩個兒童)要喝這個份量的水，以一年計算，他們每人每天便要喝超過4.5公升水。

相比之下，種植500克的豆類 (大約為煮一頓供4人用的豆製素漢堡所需的份量)，只需要用818公升水。這容易處理得多，兩個成人和兩個兒童，一年內每天大約飲用一大杯水便可。

圖 11：每星期一次無肉餐





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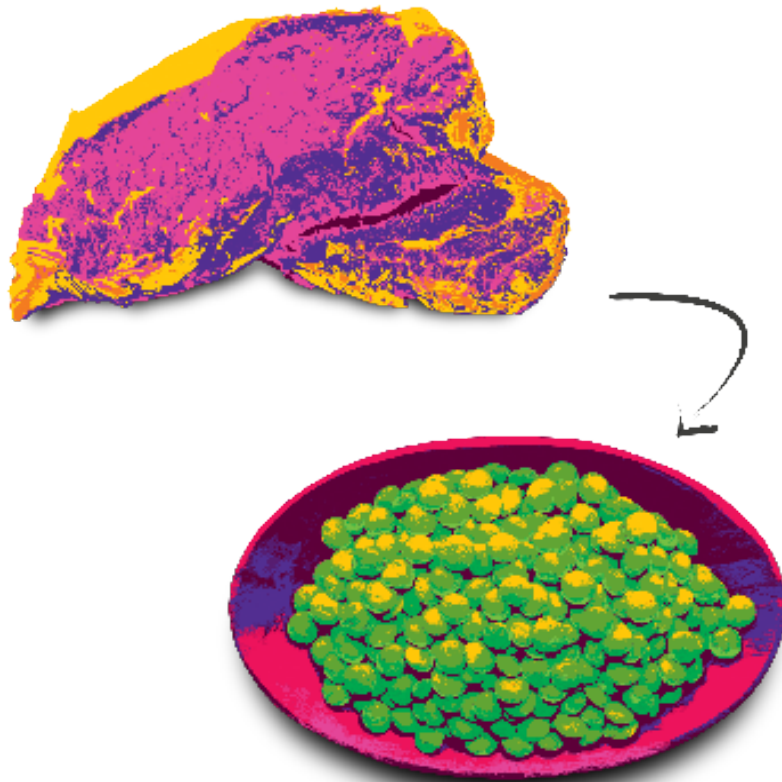
那麼，假如我們以大豆和小扁豆等，代替500克牛肉，4人份量的食物便可以節省接近6,000公升，這足以載滿17個浴缸的食水。僅僅一個家庭已可以在一餐裡節省此用水量，試想想，假如每個天天吃肉的人都能作出一點改變，可以節省的食水到底有多少。選擇以豆類代替肉類，可以幫助紓緩對食水資源的巨大壓力，並確保每個人未來都有安全穩定的糧食供應。

### 豆類與牛肉

假如美國、英國、西班牙和巴西的城市家庭，可以每星期烹煮一次無肉餐，以大豆或小扁豆來代替牛肉，每年需要飼養的牛隻就會減少950萬頭。每年所產生的甲烷亦因此減少超過900,000公噸，相等於每年減少370萬車輛在路上行走。

### 支持小規模畜牧農戶

當然，牲畜的影響並不僅於排放溫室氣體和消耗食水。在某些地區，利用不適合耕種的土地來畜牧，是最合理做法，而且很多人也依賴畜牧業為生。不過，這不代表我們需要在環境和小規模糧食生產者的生計之間，作出抉擇。我們可以每周一餐以辣豆取代辣肉醬，同時也可以在其他日子裡，透過選購能惠及小規模生產者的肉類，以示支持。



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如果我們不止於此，那麼.....

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### 今日的廚房 明日的世界

我們看到透過正面選擇為家人購買和烹調的食物，可以帶來極大的差異。一個蘋果、一排巧克力、一份蔬菜或一餐家常晚飯——我們攜手作出的選擇，可以使食物鏈變得對人和地球更好。單靠之前談及的小改變，我們便能帶來巨大的差異；只要齊心合力，不難想像我們可以達成更多大改變。

我們有能力改變全球糧食生產和分配的方式。我們可以從自己的家庭開始，一點一滴的做起。我們所作的選擇能夠帶來正面的影響，讓政府和企業知道我們對問題的關注，同時亦能推動他們盡快作出承擔和行動。假如我們能同心協力，我們的選擇和行動，能結集成足以改變全世界的力量。

## 如果我們不止於此，那麼.....

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## 一切由一個蘋果開始.....

確保我們不讓蘋果腐壞，是解決食物浪費簡單且有效的方法。我們可以從蘋果開始培養習慣，便更容易進一步作出改變。我們可以用最佳的儲存方式，令食物可以保存得更久——例如大部分水果和蔬菜，都適合存放在雪櫃內。我們可以在購物前檢查食物櫃有甚麼物資，事先計劃餐單和定下購物清單，以免不小心購買過量或來不及食用的食物。我們可以定期檢查食物上的有效日期標籤，確保在過期前把食物吃掉。我們又可以小心計算每餐的正確份量，確保不會煮得太多。假如有吃剩的食物，我們可以留待下一餐食用，而無須把食物丟掉。

所有小行動累積起來，就可以減少被丟進垃圾桶的食物——被丟棄的食物減少，就表示溫室氣體排放量也會減少。這是因為我們無需浪費能源來種植、處理和運送最終被丟棄的食物，同時因為堆填區內腐爛的食物減少，被釋放出來的溫室氣體也會減少。這對正受氣候變化影響而苦苦掙扎的小規模糧食生產者來說，這可說是喜訊。假如農民需要繼續生產我們現在和將來所需的糧食，我們就必須限制溫室氣體排放，對抗氣候變化。

## 找尋小規模食物生產者

盡可能購買公平貿易巧克力或其他產品(例如咖啡、茶、糖等)，是支持發展中國家小規模糧食生產者的好方法。雖然有時候，我們難以得知所購買的食品到底誰生產，要找尋有關資料亦不容易，但是我們可以從發問開始，向食物零售商查詢，讓他們知道我們對食物來源的關注。假如我們能集合要求得到答案的足夠人數，零售商会向我們提供這些資料。

## 季節之樂

「不時不食」，亦可以令我們的飲食習慣更可持續，這有助我們減少生產商因強行在不合適的時節種植糧食所造成的能源損耗和溫室氣體。不時不食，可讓我們品嚐到四季幻變的美味。當造食品除了分時節，也與我們所在的地區息息相關。配合本地季節自然循環的飲食，代表我們經常可以有所期待——究竟今年當造的，會是草莓或粟米？我們不會因每天吃相同的食物而感到沉悶，而且當造食物的味道通常較佳，實在值得等待。

「如何」按季節選擇食物，並沒有直接的答案，也沒有全球通用的準則。要不時不食，唯一的方法就是探索我們所在之處有甚麼當造食品，而世界其他地區又有甚麼當造，在過程中，你會發現無比樂趣，而且驚喜還不只於此！

假如我們希望食用本地生產的當造食物，又同時支持發展中國家的小型糧食生產者，情況似乎會更複雜。我們如何可以同時做到這兩點，而這兩點之間又是否互相矛盾？



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進食本地季節性食物，其中一個最明顯的好處是減少「食物里程」，即糧食從農場到餐桌上的距離。簡單來說，食物里程少，表示糧食運送的距離短，意味着當中排放的溫室氣體較少。但食物對環境的影響不僅在於運送的距離，因此在知道「這種食物在哪裡種植？」以外，我們需要發問更多問題：這農作物究竟是在自然季節中在室外種植，還是在溫室內密集式種植？食物的運輸方式又是怎樣的？

這一切都顯示，沒有必要在季節性農產品，以及支持發展中國家的小型糧食生產者之間，二擇其一。不同的糧食適合在不同地方生長：我們可以吃適合在我們居住地生長的本地季節性食物，也可以吃由世界各地生產商所種植的外國食物。

這是一個複雜的問題，當中有很多不同的考慮；我們未必能知道怎樣才是最好的做法，但重要的是我們會對糧食和當中的複雜性，表示關注。

### 精明煮食

在煮食的時候，基本的原則就簡單得多，除了確保我們有效地運用煮食爐外，還有很多方面我們可以盡一分力。微波爐和壓力煲等高能源效益電器，是利用煮食爐或焗爐煮食以外的好選擇。焗爐需要用大量能源，但在使用焗爐時，我們可以透過盡量一次過煮更多不同的食物（例如利用焗爐煮晚餐並同時焗蛋糕），善用每分能源。我們也可以檢查廚房，關掉未被使用的電器電源。很多電器在備用狀態亦會耗電。以時鐘為例，我們大概沒有需要使用每件廚房電器所設的時鐘。對於不能隨便關掉電源的電器，我們可以有效地使用它——除了盡量節能，同時也盡力發揮這些電器本身的功能。例如將雪櫃溫度保持在5°C以下，可以使食物保存得更久，使蘋果及其他蔬果不易腐爛。

這些都是我們可以在日常生活中可以做的簡單行動，幫助我們在煮食時，減少能源消耗和溫室氣體排放。這一切都關乎培養愛護地球的習慣——每日作出一點小改變，就能累積成巨大的影響力。

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### 平衡的牛肉

肉類生產為我們的環境帶來很大壓力，不但消耗大量食水和土地資源，還會排放溫室氣體。每餐「無肉餐」都可以逐步為地球減壓。隨着全球人口增長，我們需要重新平衡全球肉類消耗的耗量模式。很多在已發展國家的人需要減少吃肉的同時，很多在發展中國家的人就需要多吃肉，使每名兒童都可以獲得健康成長和發展所需的蛋白質和營養。

這並不代表我們任何人需要放棄我們喜愛的食物。與此相反，培養「素食星期一」或類似的習慣，可以讓我們有機會發掘讓人驚喜的新菜色和口味。在購買和烹調肉類時，我們亦要避免浪費。以此作為起點，我們可以盡用作為肉食的動物的每一部份，便可多走一步。一般人在超級市場只會選購某幾個肉食部位，事實上有更多美味和新奇的選擇，有待我們發掘。

### 如何修正失衡的糧食系統

我們現時的糧食系統，無論對人、對地球或對我們的未來而言，都是不完善的，需要改變。只要我們同心合力，透過日常選擇，便可著手重塑這個系統。只要我們齊心合力，就能影響政府和企業，要求他們同樣開始作出更好和更公平的選擇。

只要我們攜手，就有力量令全球糧食系統變得更公平、可持續和安全。我們已經知道如何利用有限金錢，為我們的家人提供有益、健康的食物，而我們也可以多走一步，讓我們的日常選擇對廣大的世界同樣發揮正面影響。這些行動不費時也不昂貴。我們可以從改變日常習慣開始，逐步發掘個人選擇對本地及全球的人和天然環境帶來的影響，以行動作出改變。我們又可以向政府和企業表達訴求，推動他們採取行動，令全球糧食系統更公平和可持續。

龐大的全球糧食系統或許不易理解，但只要我們同心合力，就能建立正面積極的力量，讓購物籃、廚房和餐桌成為我們解決全球糧食問題的媒介之一。



**GROW** 糧食公義運動是樂施會推行的倡議運動，旨在建立一個讓全球世代永遠吃得飽的未來。我們希望能集結全球不同人士，鼓勵大家一起在個人生活中作出正面改變，同時迫使政府和公司即時採取行動，修補失衡的全球糧食系統。**GROW** 糧食公義運動是一個對未來的美好願景，需要我們每個人的參與。現在就讓你我一同響應：

- **實行「GROW良食良方」** – 透過五個簡單原則，重新思考選購、烹調、享用食物，以至處理剩食的方式。如欲了解更多詳情，請瀏覽：[www.oxfam.org/growmethod](http://www.oxfam.org/growmethod).
- **分享「GROW良食良方」** – 與身邊好友及家人一起學習、討論及分享良食良方，在博客或其他新媒體渠道撰文，並到我們的Facebook專頁與志同道合者交流心得
- **加入GROW糧食公義運動** – 你便可以發掘更多機會，與全球各地的人攜手向政府和公司施加壓力，要求他們馬上採取行動。

了解更多詳情，可瀏覽

[www.facebook.com/GROW0xfamHK](http://www.facebook.com/GROW0xfamHK)，一同為我們所有人栽種一個更美好的未來。

## 附錄

# 數據來源及計算方法 (只提供英文版)

## INTRODUCTION

### Notes

1. World Food Programme (2012) *Hunger stats*. <http://www.wfp.org/hunger/stats> – accessed 26 June 2012.
2. Oxfam (2011) *Growing a Better Future: Food Justice in a Resource-constrained World*.
3. Nielsen (2011) *Women of tomorrow: A study of women around the world* states that women control the majority of purchasing decisions in a household, and that their influence is growing. In developed economies (including Spain, the UK and USA) 43 per cent of women and men surveyed felt that the most appropriate decision makers for purchases and activities relating to food were primarily women, while 51 per cent felt that both men and women equally were appropriate decision makers. Only 6 per cent felt that the most appropriate decision makers were primarily men. In emerging economies (including Brazil and India) 48 per cent of women and men surveyed felt that the most appropriate decision makers for purchases and activities relating to food were primarily women, while 43 per cent felt that both men and women equally were appropriate decision makers. 8 per cent felt that the most appropriate decision makers with respect to food were primarily men.
4. OECD (2011) *Society at a Glance 2011: OECD Social Indicators: Cooking and Caring, Building and Repairing: Unpaid Work around the World*. Data drawn from detailed time-use surveys for 26 OECD countries, and for China, India and South Africa, shows that 82 per cent of women participate in cooking, while 44 per cent of men do. Women spend an average of 83 minutes per day on cooking and food clean-up, compared to 21 minutes for men.

### Survey methodology

A survey of a total of 5,100 women from Brazil, India, Spain, the Philippines, the UK and USA was conducted online, between 31 May 2012 and 11 June 2012. Respondents were selected as those aged between 18 and 64; classing themselves as living in 'a big city,' 'the suburbs or outskirts of a big city,' or 'a small city or large town'; responding 'yes' to the question 'are you the mother or main or joint carer of any child/children aged 17 or under who lives in your household?'; and stating that they have responsibility for 'some', 'half' or 'all or most' of the food shopping and the cooking in their household. The survey was designed by Brook Lyndhurst, in consultation with Oxfam, and was conducted by GfK NOP.

All figures in this report were produced by Brook Lyndhurst, using data from the survey described above. All figures use the full base (5,100) with the exception of Figure 7, which excludes respondents who stated that they do not buy fresh fruit and vegetables, and Figure 11, which excludes respondents who stated that they do not buy meat.

### Bibliography

Bailey, R. (2011) *Growing a better future: Food justice in a resource-constrained world*. Oxfam.

## IF IT IS BROKE, LET'S FIX IT

### Notes

5. nVision Research for Oxfam (2010) In a survey of mothers in towns and cities, 85 per cent in India, 84 per cent in Brazil, 68 per cent in Spain, and 60 per cent in the USA, agreed or strongly agreed with the statement "I am strongly concerned about what I personally can do to help to protect the environment." Base: 1,000-7,000



online respondents per country, aged 16-64 (China 16-54). In the same survey, 74 per cent of respondents in India, 72 per cent in Brazil, 37 per cent in Spain, and 27 per cent in the USA agreed or strongly agreed with the statement "I would be willing to pay as much as 10 per cent more for grocery items if I could be sure that they would not harm the environment". Base: 1,000-5,000 online respondents per country, aged 16-64 (China 16-54). The definition of mothers for this research in the USA, Brazil and India was women with tertiary education and at least one child under 16 living in the household. In Great Britain and Spain it was women with at least one child under 16 living in the household.

6. Fletcher, J. and Downing, P. (2011) *Consumer understanding of green terms: A report to the Department for Environment, Food and Rural Affairs* (Brook Lyndhurst & Icaro Consulting) states that people may find it difficult to judge the value and importance of different environmental or ethical terms or claims made on or about products. For example, 43 per cent of respondents said they found it difficult to understand whether a product is environmentally-friendly based on the information on product packaging.

## The broken food system

### Notes

7. Bailey, R. (2011) *Growing a better future: Food justice in a resource-constrained world* (referencing FAO (2009) *How to Feed the World in 2050*). Oxfam.
8. Fairtrade Foundation (2009) *The global food crisis and Fairtrade: Small farmers, big solutions?* states that small-scale farmers produce, for example, up to 80 per cent of Zambia's food, and up to 45 per cent of Chile's vegetables, corn and rice.
9. Department for International Development (2011) *Scaling Up Nutrition: The UK's position paper on undernutrition* states that 86 per cent of the world's poor who live in rural areas rely on agriculture for their own survival.
10. Gustavsson, J., Cederberg, C., Sonesson, U., van Otterdijk, R. and Meybeck, A. (2011) *Global food losses and food waste*. FAO.
11. Fairtrade Foundation (2009) *The global food crisis and Fairtrade: Small farmers, big solutions?* A considerable body of evidence suggests that small, integrated farming systems yield more per hectare in the long-term than large-scale monoculture farms.
12. Department for International Development (2011) *Scaling Up Nutrition: The UK's position paper on undernutrition*.
13. Oxfam (2011) *Growing a Better Future: Food Justice in a Resource-constrained World*.
14. Fairtrade Foundation (2009) *The global food crisis and Fairtrade: Small farmers, big solutions?* In Africa, women receive only 5 per cent of government training and support for smallholders.
15. FAO (2012) *Men and women in agriculture: closing the gap* states that this would enable women to increase yields by 20-30 per cent. <http://www.fao.org/sofa/gender/en/> – accessed 1 June 2012.
16. Smil, V. (2004) *Improving efficiency and reducing waste in our food system*. *Environmental Sciences* 1(1): 17-26
17. Millstone, E. and Lang, T. (2008) *The atlas of food: who eats what, where and why*, quoting FAO statistics for the Horn of Africa from 2001-2003.

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18. FAO (2012) *FAO Programme: Food security*. <http://www.fao.org/gender/gender-home/gender-programme/gender-food/en/> – accessed 21 June 2012.
19. Raworth, K. (2012) *A Safe and Just Space for Humanity: Can we live within the doughnut?* Oxfam. <http://policy-practice.oxfam.org.uk/publications/a-safe-and-just-space-for-humanity-can-we-live-within-the-doughnut-210490> – accessed 22 June 2012.
20. For example, Defra (2011) *Attitudes and Behaviours around Sustainable Food Purchasing* showed that only 17 per cent of households strongly agreed with the statement “I have a good understanding of the issues surrounding buying local / seasonal products”, and that while 70 per cent of households feel that buying sustainable fish is important, a third are not sure how to choose sustainable fish products and are confused by labelling. 35 per cent of households were actively seeking to buy British seasonal produce when buying fruit and vegetables, while a further 37 per cent stated that they were doing this, but not as much as they would like. US Farmers and Ranchers Alliance (2011) *Food Dialogues* showed that US consumers were divided as to whether the US was heading in the right or wrong direction in the way they produce food. Consumers were confused over the effects of government regulations on farming, how pesticides are used, genetic engineering, how antibiotics are used, and how livestock and poultry are cared for. <http://www.fooddialogues.com/survey-responses/> – accessed 22 June 2012.
21. FAO (2009) *Low Greenhouse Gas Agriculture: Mitigation and Adaptation Potential of Sustainable Farming Systems*.
22. FAO (undated) *Climate-smart agriculture: managing ecosystems for sustainable livelihoods*.
23. FAO (2009) *Low Greenhouse Gas Agriculture: Mitigation and Adaptation Potential of Sustainable Farming Systems*. This report cites Erisman et al. (2008) who report that only 17 per cent of the 100 Mt N produced in 2005 was taken up by crops, while the remainder was lost to the environment. For example, “high levels of reactive nitrogen (NH<sub>4</sub>, NO<sub>3</sub>) in soils may contribute to the emission of nitrous oxides and are main drivers of agricultural emissions”.

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Biello, D. (2008) *Fertilizer Runoff Overwhelms Streams and Rivers- Creating Vast “Dead Zones”*. Scientific American 14th March 2008. <http://www.scientificamerican.com/article.cfm?id=fertilizer-runoff-overwhelms-streams> – accessed 17 May 2012.

Edward-Jones, G. (2009) *Does eating local food reduce the environmental impact of food production and enhance consumer health?* Symposium on ‘Food supply and quality in a climate-changed world’.

MacMillan, T. and Fredenburgh, J. (2009) *What should supermarkets do about seasonal food?* A discussion paper for The Co-operative.

Oxfam (2009) *4-a-week: Changing food consumption in the UK to benefit people and planet*.

UNEP (2009) *The Environmental Food Crisis*.

Water Encyclopedia (2012) *Algal blooms in fresh water*.  
<http://www.waterencyclopedia.com/A-Bi/Algal-Blooms-in-Fresh-Water.html> - accessed 18 May 2012.

WHO (2012) Obesity. <http://www.who.int/topics/obesity/en/> - accessed 21 June 2012.

## What we can do

### Notes

24. The table on the following page illustrates the population figures used in the 'what if' calculations.

## WHAT IF...

### What if... we never let an apple spoil?

#### Notes

25. Gustavsson, J., Cederberg, C., Sonesson, U., van Otterdijk, R. and Meybeck, A. (2011) *Global food losses and food waste*. FAO.
26. Bailey, R. (2011) *Growing a better future: Food justice in a resource-constrained world*. Oxfam. This report references FAO (2009) *How to Feed the World in 2050* which anticipates that global food demand could grow by 70 per cent by 2050.
27. Apples have been chosen as an example of a food that is nearly universally bought across the six countries used as case studies for this report, and which are frequently stored in a way which is less than optimal.
28. Exodus research (2007) *Food storage and packaging* (WRAP) showed that nearly two thirds of respondents to a survey of 1,001 UK residents stored fresh fruit in a container in the light, such as a fruit bowl. In Johnson, D., Hipps, N. and Hails, S. (2008) *Helping consumers reduce fruit and vegetable waste: final report* (WRAP), 54 per cent of respondents in a UK survey (Base: 1,001) stated that they never stored apples the fridge, and a further 29 per cent stated that they were never/rarely stored this way. As part of the survey carried out for this report, 5,084 women in Brazil, India, the Philippines, Spain, the UK and USA were asked about where they stored apples. 42 per cent do not usually store apples in the fridge. Storing apples outside the fridge was most common in the UK (69 per cent) and in Spain (64 per cent).

#### Calculations

*Of all the fresh apples bought in Brazil, India, Spain, the Philippines, the UK and USA, one in six ends up in the garbage can:*

Figures for metric tonnes of apples purchased for fresh, domestic consumption were taken from Index Mundi (2011) *Fresh Apples Fresh Domestic Consumption by Country in MT*. (<http://www.indexmundi.com/agriculture/?commodity=apples&graph=fresh-domestic-consumption> - accessed 1 June 2012).

According to this source, the amount of apples consumed annually (2011 data), in metric tonnes, is 1,095,000 MT in Brazil, 1,850,000 MT in India, 75,000 MT in the Philippines, and 2,193,927 MT in the USA. In the EU27, 7,872,300 MT of apples are consumed annually. Assuming that apples consumption in Europe is evenly spread per capita and there are 502.5 million residents in the EU27 (according to a 2011 Eurostat News Release on European demography:

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Statistic	Brazil	India	Philippines	Spain	UK	USA	Source
Total population (2010)	195,423,000	1,214,464,000	93,617,000	45,317,000	62,130,000	317,641,000	Food and Agriculture Organisation of the United Nations (2011) The State of Food and Agriculture 2010-2011: Women in Agriculture - Closing the gender gap for development.
Urban population	169,040,895	365,553,664	62,161,688	35,075,358	55,854,870	261,418,543	Calculated using figures from: Food and Agriculture Organisation of the United Nations (2011) The State of Food and Agriculture 2010-2011: Women in Agriculture - Closing the gender gap for development.
Urban share of population	87 per cent	30 per cent	66 per cent	77 per cent	90 per cent	82 per cent	Calculated using figures from: Food and Agriculture Organisation of the United Nations (2011) The State of Food and Agriculture 2010-2011: Women in Agriculture - Closing the gender gap for development.
Number of households	68,399,000	306,200,000	18,539,769	14,187,169	26,258,000	114,235,996	
Sources	Instituto Brasileiro de Geografia e Estatística, 2010 final census results	Census of India, 2011 provisional results for number of occupied houses	National Statistics Office, Manila, Philippines, 2007 Census results	Instituto Nacional de Estadística, 2001	Office of National Statistics, mid-2010 estimates	United States Census Bureau, QuickFacts, 2006-2010	
Number of urban households	59,165,135	92,166,200	12,310,407	10,980,869	23,605,942	94,016,225	Calculated using the census data cited above and figures from Food and Agriculture Organisation of the United Nations (2011) The State of Food and Agriculture 2010-2011: Women in Agriculture - Closing the gender gap for development.

[http://epp.eurostat.ec.europa.eu/cache/ITY\\_PUBLIC/3-28072011-AP/EN/3-28072011-AP-EN.PDF](http://epp.eurostat.ec.europa.eu/cache/ITY_PUBLIC/3-28072011-AP/EN/3-28072011-AP-EN.PDF) – accessed 1 June 2012), then annual apple consumption is estimated at 973,345 MT in the UK and 709,948 MT in Spain. This calculation assumed that apples are wasted in Brazil, India, Spain, the Philippines, and the USA in line with the average regional consumer waste rates of fruit and vegetables, quoted in Gustavsson, J., Cederberg, C., Sonesson, U., van Otterdijk, R. and Meybeck, A. (2011) *Global food losses and food waste* (FAO) as around 10 per cent in Latin America; 7 per cent in South & South East Asia; 19 per cent in Europe; and 28 per cent in North America. Using these waste rates gives 109,500 MT of apples wasted annually in Brazil, 129,500 MT in India, 5,250 MT in the Philippines, 614,299 MT in the USA, and 134,890 MT in Spain. In the UK, Quested, T. and Johnson, H. (2009) *Household food and drink waste in the UK* (WRAP) show that 260,000 tonnes of apples are lost as consumer food waste per year. Across these six countries, 1,253,439 MT of apples are wasted out of 6,897,220 MT purchased; in other words, the proportion of apples wasted out of those purchased by consumers is 18 per cent or just over one in six.

***Over 5.3 billion apples could be saved every year:***

Assuming that apple waste is evenly spread across all households, then the amount of apples wasted annually in urban households is 95,265 MT in Brazil, 38,850 MT in India, 3,465 MT in the Philippines, 503,726 MT in the USA, 234,000 MT in the UK, and 103,865 MT in Spain – in total, 979,171 MT/year. Assuming that an apple weighs 182g (Foodfacts.com (2002-2012) Nutrition Facts and Information for Apple with skin.

<http://www.foodfacts.com/NutritionFacts/Apples/Apple-with-skin-Medium-275-diameter-182-g/2013> – accessed 21 June 2012), 5,380,060,852 apples are estimated to be wasted each year in urban households.

***Enough apples, lined up side by side, to stretch more than nine times around the Earth:***

According to Foodfacts.com (2002-2012) Nutrition Facts and Information for Apple with skin (<http://www.foodfacts.com/NutritionFacts/Apples/Apple-with-skin-Medium-275-diameter-182-g/2013> – accessed 21 June 2012), the diameter of a medium to large apple is 6.985 cm. NASA (2012) Solar system facts and figures (<http://solarsystem.nasa.gov/planets/profile.cfm?Display=Facts&Object=Earth> – accessed 21 June 2012) gives the equatorial circumference of the earth as 40,030.2 kilometers. 5,380,060,852 apples would therefore stretch 9.39 times around the globe.

***These wasted apples alone would be responsible for as many greenhouse gas emissions as burning 10 million barrels of oil:***

King, R. (2009) *4-a-week: Changing food consumption in the UK to benefit people and planet* (Oxfam GB) states that “Every tonne of household food waste is responsible for 4.5 tonnes of carbon dioxide equivalent (CO<sub>2</sub>e).” The 979,171 metric tonnes of apples wasted by urban households each year therefore equate to 4,406,270 tonnes of CO<sub>2</sub>e. A barrel of oil results in 0.43 metric tonnes of CO<sub>2</sub> (United States Energy Protection Agency’s Greenhouse Gas Equivalencies Calculator. Calculations and references. <http://www.epa.gov/cleanenergy/energy-resources/refs.html#oil> – accessed 21 June 2012.) and the emissions impact of these wasted apples is therefore equivalent to 10,247,138 barrels of oil.

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Cox, J. and Downing, P. (2007) *Food behaviour consumer research: Quantitative phase*. Waste and Resources Action Programme.

Love Food Hate Waste (undated) Storing Apples.

<http://england.lovefoodhatewaste.com/hints-and-tips/storing-apples> – accessed 21 June 2012.

## What if... when we treated ourselves to chocolate, we made sure it was Fair Trade chocolate?

### Notes

29. Fairtrade Foundation (2009) *The global food crisis and Fairtrade: Small farmers, big solutions?* This report states that “the vast majority of households in developing countries, including small farmers, are net buyers of food (they spend more on food than they earn from selling it) who spend 60 per cent-80 per cent of their income on food” and “only a minority of small farmers are net sellers of food”.
30. According to CAOBISCO International Confectionery Association (2010) *The world cocoa economy: past and present*, in the UK, the equivalent of 16.5 50g bars of chocolate confectionary are eaten per person, every month; in the USA, 8.2 bars; in Spain, 5.3 bars; and in Brazil, 4.0 bars. eSpatial’s (2012) *A Valentine’s Day map: World chocolate consumption* (<http://www.espatial.com/articles/a-valentines-day-map-world-chocolate-consumption/> – accessed 21 June 2012) illustrates chocolate consumption in these countries and others.
31. World Cocoa Foundation (2010) *Cocoa market update May 2010* (<http://www.worldcocoafoundation.org/learn-about-cocoa/documents/CocoaMarketUpdateasof5.18.10.pdf> – accessed 21 June 2012) states that close to 50 million people are dependent on cocoa for their livelihoods. Fairtrade Foundation (2011) *Fairtrade and cocoa: Commodity briefing* notes that many cocoa farmers and workers are among the 2.1 billion people living on \$2 a day. In World Fair Trade Organisation (2011) *10 Principles of Fair Trade* ([http://www.wfto.com/index.php?option=com\\_content&task=view&id=2&Itemid=14](http://www.wfto.com/index.php?option=com_content&task=view&id=2&Itemid=14) – accessed 21 June 2012) the fourth principle is ‘Payment of a fair price’.
32. Food and Agriculture Organisation of the United Nations (2011) *The State of Food Insecurity in the World – How does international price volatility affect domestic economies and food security?* This report states that “changes in [farmer] income due to price swings can reduce children’s consumption of key nutrients during the first 1,000 days of life from conception, leading to a permanent reduction of their future earning capacity, increasing the likelihood of future poverty and thus slowing the economic development process.” Department for International Development (2011) *Scaling Up Nutrition: The UK’s position paper on undernutrition*. This report states that many children are born undernourished because their mothers are undernourished, and hunger and undernutrition lead to stunted growth and compromise brain development. The report references a study which found that for every 10 per cent increase in levels of stunting among children, the proportion of children reaching the final grade of school dropped by almost 8 per cent; and another which showed that improving physical growth among children under the age of two resulted in a 46 per cent increase in adult wages when these children grew up.

### Calculations

*Over the course of a year, those 12.5 billion bars of Fair Trade chocolate would support the people who live and work on over 90,000 small-scale cocoa farms:*

If every member of the urban population of Brazil, Spain, the UK and USA purchased two 50g Fair Trade chocolate bars every month, this would equate to 625,668 MT of Fair Trade chocolate per year. UK regulations specify a

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minimum of 20 per cent cocoa solids in family milk chocolate (Legislation.gov.uk (2003) *The Cocoa and Chocolate Products (England) Regulations 2003*. <http://www.legislation.gov.uk/ukxi/2003/1659/schedule/1/made> – accessed 21 June 2012). USA regulations specify a minimum of 10 per cent cocoa solids in milk chocolate (National Confectioners Association (2012) *Chocolate Terms and Definitions*. <http://www.candyusa.com/FunStuff/CandyType.cfm?ItemNumber=1666> – accessed 21 June 2012) and EU regulations (applied to Spain for the purposes of this calculation) specify 30 per cent (EUR-Lex (2000) *Directive 2000/36/EC of the European Parliament and of the Council of 23 June 2000 relating to cocoa and chocolate products intended for human consumption*. <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32000L0036:EN:NOT> – accessed 21 June 2012.) A figure could not be identified for Brazil, so the average of 20 per cent was assumed. These chocolate bars would therefore contain a minimum of 97,972 MT of cocoa solids. To produce a conservative estimate of the area required to grow sufficient cocoa for this purpose, this calculation assumes that 100 per cent of the cocoa bean becomes cocoa solids which may contribute to the cocoa solid content of milk chocolate bars purchased. The average yield of cocoa is 350kg/hectare (International Cocoa Organisation (1999) *How many smallholders are there worldwide producing cocoa? What proportion of cocoa worldwide is produced by smallholders?* <http://www.icco.org/faq/57-cocoa-production/123-how-many-smallholders-are-there-worldwide-producing-cocoa-what-proportion-of-cocoa-worldwide-is-produced-by-smallholders.html> – accessed 21 June 2012) and therefore at least 279,921 hectares would be required to produce 97,972 MT of cocoa solids. International Cocoa Organisation (1999) *How many smallholders are there worldwide producing cocoa? What proportion of cocoa worldwide is produced by smallholders?* (<http://www.icco.org/faq/57-cocoa-production/123-how-many-smallholders-are-there-worldwide-producing-cocoa-what-proportion-of-cocoa-worldwide-is-produced-by-smallholders.html> – accessed 21 June 2012) states that almost 90 per cent of production of cocoa worldwide comes from smallholdings under 5 hectares. Worldwide, the average area of land that a Fairtrade small-scale farmer devotes to cocoa cultivation is 3 hectares. (Kilpatrick, K. (2011) *Monitoring the scope and benefits of Fairtrade*. Fairtrade Foundation.), meaning that 93,307 farmers would receive an income from these chocolate bars.

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## What if... we could save energy when cooking?

### Notes

33. Energy Saving Trust (2011) *The elephant in the living room: how our appliances and gadgets are trampling the green dream* states that, despite buying more efficient appliances, people in the UK continue to use more energy in their homes. Davis, L. W., Fuchs, A. and Gertler, P. J. (2012) *Cash for Coolers* examines a large-scale appliance replacement program in Mexico. Since 2009, this scheme has helped 1.5 million households replace their old refrigerators and air-conditioners with energy-efficient models. Although refrigerator replacement reduces electricity consumption by an average of 11 kilowatt hours per month (about a 7 per cent decrease), air conditioning replacement in fact increases electricity consumption by an average of 6 kilowatt hours per

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month, with larger increases during the summer. Because energy-efficient durable goods cost less to operate, households use them more. This behavioural response, sometimes called the “rebound” effect, is important for air-conditioners, but not important for refrigerators.

34. Boardman, B., Favis-Mortlock, D., Hinnells, M., Lane, K., Milne, G., Palmer, J., Small, E., Strang, V. and Wade, J. (1995) *DECADE Domestic Equipment and Carbon Dioxide Emissions: Second year report* states that when using a solid electric stove, a pot with a warped bottom reduces heat flows and increases the required cooking energy by half.
35. Oberasher, C., Stamminger, R. and Pakula, C. (2011) *Energy efficiency in daily food preparation*. International Journal of Consumer Studies 35(2): 201-211. A case study of boiling potatoes was used, and the 70 per cent saving represents a comparison between the least favourable method – in which a lot of water is used, the pot is not covered with a lid, and the temperature is not reduced once the boiling point has been reached, and the most favourable method – where a small amount of water is used, the pot is covered with a lid, and the heat is reduced as soon as the boiling point is reached.
36. Boardman, B., Favis-Mortlock, D., Hinnells, M., Lane, K., Milne, G., Palmer, J., Small, E., Strang, V. and Wade, J. (1995) *DECADE Domestic Equipment and Carbon Dioxide Emissions: Second year report* states that “LEEP suggest that hob use is responsible for as much as 49 per cent of total cooker electricity use. Thus it may be that households [in the UK] are moving away from oven cooking towards greater use of the hob. This is supported by qualitative and quantitative research (Parkinson Cowan 1995, Wilson and Rees pers. comm 1995.). It is assumed that the proportion of cooker electricity use attributable to hobs has increased from 33 per cent to 49 per cent over the period 1970 to 1992 where both hob and oven are electric.”
37. Energy Saving Trust (2011) *The elephant in the living room: how our appliances and gadgets are trampling the green dream*. Boardman, B., Favis-Mortlock, D., Hinnells, M., Lane, K., Milne, G., Palmer, J., Small, E., Strang, V. and Wade, J. (1995) *DECADE Domestic Equipment and Carbon Dioxide Emissions: Second year report*.
38. Market Transformation Programme (2008) *BNCK01: Assumptions underlying the energy projections of cooking appliances* calculates that in the UK, the average lifespan of an oven is 18.65 years in the MTP modelling. This figure is calculated from the trend in sales necessary to maintain the appropriate level of stock in people’s homes.

### Calculations

*If all urban households in Brazil, India, the Philippines, Spain, the UK and the USA took these simple steps, over 30 million megawatt hours of energy could be saved every year:*

The average number of stove uses is drawn from a UK based study by the Market Transformation Programme (2008) *BNCK01: Assumptions underlying the energy projections of cooking appliances*, which assumes 424 uses of the stove per year, with 0.71kWh being consumed at each use (this is the same for gas and electric stoves). Assuming that stove use frequency is similar in the six countries considered, urban households in these countries use 87,977,367 MWh of energy for stove cooking every year. In order to account for the variation in efficiency of stove use, it is assumed that half of all stove uses are already entirely efficient, while the other half are maximally inefficient, and that 70 per cent of energy can therefore be saved in half of total uses of the stove by urban households in these countries. This adds up to a total of 30,790,000 MWh of energy per year.

*The benefit for the environment would be greater than if these same households each planted a tree seedling and let it grow for ten years:*



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Carbon equivalent calculated using The US EPA Greenhouse Gas Equivalencies Calculator (<http://www.epa.gov/cleanenergy/energy-resources/calculator.html> – accessed 21 June 2012). Assumptions made in this calculation are detailed at <http://www.epa.gov/cleanenergy/energy-resources/refs.html#seedlings>. Exact figures are 544,395,000 trees, across 292,244,777 urban households, or approximately 1.86 trees per household.

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Fechner, J. V. (1977) *Human factors in appliance energy-consumption*. In: Proceedings of the IEEE Appliance Technical Conference, Pittsburgh, Pennsylvania, 10th May 1977.

## What if... urban households ate a meat-free meal once a week?

### Notes

39. Worldwatch Institute (2011) *Meat production continues to rise*, citing FAO (2007) *Livestock's Long Shadow*, Environmental Issues and Options. <http://www.worldwatch.org/node/5443#notes> – accessed 16 May 2012.
40. The National Geographic (2012) *The Hidden Water We Use* (<http://environment.nationalgeographic.com/environment/freshwater/embedded-water/> – accessed 16 May 2012) shows that 500g beef takes 6,810 litres of water to produce. In contrast to beef, producing 500g of soya beans requires 818 litres of water.
41. This is the equivalent of a 560 ml (just less than an imperial pint) glass of water.
42. UNEP (2012) *Global Environment Outlook: Environment for the Future we Want (GE05)*. Nairobi: United Nations Environment Programme. 80 per cent of people live in areas with high levels of threats to water security, including 3.4 billion people in the most severe threat category.
43. UNEP (2009) *The environmental food crisis* estimates that in the next few decades, water use will continue to increase – by 22-35 per cent by 2025, and nearly 100 per cent by 2050. This report notes that although the combined effects of overuse of ground and surface water, glacial melt, poor water-use efficiency, and climate change are difficult to estimate, a 10-30 per cent yield loss in the world's irrigated croplands due to lower availability of water for irrigation (without increased water efficiency) would equate to losses in the range of 4-12 per cent of world cereal production.
44. FAO (2009) *The State of Food and Agriculture – Livestock in the Balance*. In the 14 countries covered by the FAO Rural Income Generating Activities database, 60 per cent of rural households own livestock, and 10 per cent of the total income of all rural households comes from livestock.

### Calculations

*If we swap that 500g of beef for an alternative, such as beans or lentils, we can save nearly 6,000 litres of water in just one four-person meal. That's the equivalent of seventeen bathtubs filled to the brim, and then some:*

The National Geographic (2012) *The Hidden Water We Use* (<http://environment.nationalgeographic.com/environment/freshwater/embedded-water/> – accessed 16 May 2012) shows that 500g beef takes 6,810 litres

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of water to produce. In contrast to beef, producing 500g of soya beans requires 818 litres of water. A saving of 5,992 litres of water could be made. Assuming a bathtub is 150 cm long, 75 wide and 30 cm deep i.e. 337.5 litres in capacity, this amount of water would fill 17.75 bathtubs.

*If urban households in the USA, UK, Spain and Brazil were to eat a meat-free meal once a week, swapping beef for beans or lentils, around nine and a half million fewer cows would need to be reared every year:*

This calculation uses Index Mundi (2012) data on beef and veal meat per capita consumption by country (<http://www.indexmundi.com/agriculture/?commodity=beef-and-veal-meat&graph=per-capita-consumption> – accessed 16 May 2012) which draws on data from the USDA. The figures are: USA 36 kg/capita/year, UK 15 kg/capita/year, Spain 15 kg/capita/year and Brazil 39 kg/capita/year (NB. Data for the UK and Spain use EU-27 data). Assuming an average serving size of 125g of beef, the number of meals per person per week containing beef are 5.5 in the USA, 2.3 in the UK, 2.3 in Spain and 6.0 in Brazil. If the urban population in each of these four countries ate 125g less beef per person each week, the reduction would total 3,389 million kg/year. If the average cow weighs 352.55 kg (taking the average slaughter weight of steers, heifers, bulls and cows from Beef USA from National Cattlemen’s Beef Association (2012) *Beef industry statistics* (<http://www.beefusa.org/beefindustrystatistics.aspx> – accessed 16 May 2012)) and conservatively assuming that the whole cow could be eaten, this reduction equates to 9,612,787 cows.

*That would mean over 900,000 tonnes less methane being produced every year making as much of a difference to the environment as taking over 3.7 million cars off the road for a year:*

According to US EPA (2007) *Ruminant livestock* (<http://www.epa.gov/rlep/faq.html> – accessed 16 May 2012), an adult cow produces between 80–110 kg of methane per year. Taking the mid-point of 95 kg/methane/year, 9,612,787 cows produce 913,214,734 kg of methane in a year.

According to the US EPA Greenhouse Gas Equivalencies Calculator (<http://www.epa.gov/cleanenergy/energy-resources/calculator.html> – accessed 21 June 2012) 913,214,734 kg of methane is equivalent to the annual greenhouse gas emissions (using CO<sub>2</sub> equivalencies) of 3,760,297 passenger vehicles. Assumptions made in this calculation are detailed at <http://www.epa.gov/cleanenergy/energy-resources/refs.html#vehicles>.

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## WHAT IF... WE DIDN'T STOP THERE?

### Notes

45. Mintel (2010) *Food Provenance - UK - April 2010* suggests that 14 million people in the UK see food origin labelling as sometimes misleading. <http://oxygen.mintel.com/display/479965/> – accessed 22 June 2012.
46. AEAT (2005) *The validity of food miles as an indicator of sustainable development* states that “transport of food by air has the highest CO<sub>2</sub> emissions per tonne, and is the fastest growing mode. Although air freight of food accounts for only 1 per cent of food tonne kilometres and 0.1 per cent of vehicle kilometres, it produces 11 per cent of the food transport CO<sub>2</sub> equivalent emissions.” Fairtrade Foundation (2007) *Q&A: Fairtrade, Climate Change and Sustainable Production* states that, in 2005, transportation of Fairtrade products to the UK

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accounted for 0.03 per cent of UK food transport emissions and 0.001 per cent of the UK's total carbon dioxide emissions.

47. See e.g. The Vegetarian Society (undated) Vegetarian recipes. <http://www.recipes.vegsoc.org/> – accessed 22 June 2012.

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Tuffrey, L. (2012) *Nose to tail eating: it's sustainable but can you stomach this type of meat?* The Ecologist 28 March 2012. [http://www.theecologist.org/green\\_green\\_living/food\\_and\\_drink/1299412/nose\\_to\\_tail\\_eating\\_its\\_sustainable\\_but\\_can\\_you\\_stomach\\_this\\_type\\_of\\_meat.html](http://www.theecologist.org/green_green_living/food_and_drink/1299412/nose_to_tail_eating_its_sustainable_but_can_you_stomach_this_type_of_meat.html) – accessed 22 June 2012

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